



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of :

Koveal et al.

U.S. Serial No.: 10/059,927

Filed: January 29, 2002

Catalyst Enhancement

Before The Examiner:

J Parsa

Group Art Unit 1621

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

DECLARATION TRAVERSING GROUNDS FOR REJECTION (37 C.F.R. § 1.132)

I, Michel Daage, declare that:

1. I am an employee of ExxonMobil Research and Engineering Company. I have a Doctorat és Sciences Physiques from Université des Sciences et Techniques de Lille (France). I have worked in the area of Catalysis science for 19 years.
2. I am a co-inventor of the above-referenced patent application.
3. I have reviewed the Office Action and am familiar with the Examiner's rejections.
4. The accompanying chart compares examples from the present invention and the prior art, and illustrates differences in catalyst metal states based on the particular catalyst regeneration step.
5. As can clearly be seen on the chart, the catalyst metal state will differ significantly depending on the order of a given regeneration step. Furthermore, the catalyst metal state during any sequence of a regeneration or activation process will ultimately affect the final catalytic properties of a regenerated or activated catalyst.
6. Examples 8, 9 and 17 are examples of the present invention, and show that the steps of the present invention will produce mixed catalyst metal hydroxides and salts in the step after oxidation in the presence of the impregnating solution. The prior art does not disclose such a sequence of steps, and thus does not produce this specific catalyst metal state.

7. Because the sequence of steps in the present invention is unlike any taught or suggested by the prior art, the final catalyst product is also unlike any prior art catalyst. A further reading of the chart shows that the CO consumption, given in gms/hr/liter of catalyst, is significantly higher than the catalysts of the prior art. This is evidence that the catalyst product of the present invention is different from the catalysts produced by the prior art.
8. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful and false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: _____

12/18/03

Michel A Daage
Michel Daage

Example	4	5	6	12	8	9	17	May, Ex. 2	May, Ex. 4	Lapidus, Ex 1	Lapidus Ex. 2,3,4
Step 1	Solvent Wash	Solvent Wash	Hydrogen Treat	Solvent Wash	Solvent Wash	Solvent Wash	Solvent Wash	Impregnation of solution of metal on support	Impregnation of solution of metal on support	Impregnation of solution of metal on support	Impregnation of solution of metal on support
Step 2	Hydrogen Treat	High Temperature Dry Oxidation	Impregnation in inert atmosphere with water	High Temperature Dry Oxidation	Hydrogen Treat	Hydrogen Treat	Hydrogen Treat	Dry	Dry	Dry	Dry
Step 3	Hydrogen Treat	Low Temperature Oxidation with impregnated water	Impregnation in inert atmosphere with aqueous ammonium acetate and ammonia	Impregnation in inert atmosphere with aqueous ammonium acetate and ammonia	Hydrogen Treat	Impregnation in inert atmosphere with aqueous ammonium acetate and ammonia	Impregnation in inert atmosphere with aqueous ammonium acetate and ammonia	High Temperature Dry Oxidation	High Temperature Dry Oxidation	High Temperature Dry Oxidation	High Temperature Dry Oxidation
Step 4			Dry and Calcine	Low Temperature Oxidation in presence of impregnated solution	Low Temperature Oxidation in presence of impregnated solution	Low Temperature Oxidation in presence of impregnated solution	Low Temperature Oxidation in presence of impregnated solution	High Temperature Dry Oxidation	High Temperature Dry Oxidation	High Temperature Dry Oxidation	Leaching with Na4EDTA solution
Step 5			Hydrogen Treat	Dry and Calcine	Dry and Calcine	Dry and Calcine	Dry and Calcine				Filtration (6, 10, or 12% Co remaining on support)
Step 6				Hydrogen Treat	Hydrogen Treat	Hydrogen Treat	Hydrogen Treat				Dry
Step 7											Hydrogen Treat
CO Conversion, %	27.3	55	55.1	59.5	73.9	80.7	82.1	74.2	90.4	65	72
CH4 Selectivity, %	7.6	10.9	9.5	6	7.7	6.5	7.1	7.8	7.6	NA	NA
GHSV, 1/hr	6010	6010	6010	6010	6010	6010	6010	1000	1000	100	100
H2/CO	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.07	2.07	2	2
CO Consumption, gms/hr/liter catalyst	675	1359	1362	1470	1826	1994	2029	302	368	27	30
% improvement	Base	101	102	118	171	196	201	Base	22	Base	11

Cobalt Metal	Cobalt Oxide	Cobalt Hydroxide	Cobalt Salts	Mixed Cobalt Hydroxide and Cobalt Salts
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